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Alternative Local Revenue Sources for the Appalachian Ohio Regional Transit Authority (AORTA)

by

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Introduction

Revenue and expenditure projections for AORTA are reported in section one. Revenue projections are made for a one-mill property tax by county and for a 1/2 of 1 percent sales tax levy. Expenditures are assumed to increase by 10 percent annually based on 1977 data. Given the estimated increase in expenditures and other revenue sources, the required tax rates or passenger fares are estimated.

While the data used in these estimates can only give rough approximations, it is clear that either a sales tax or property tax would yield sufficient revenues. The key question is whether or not these levies would pass. Section two discusses the economic rationale for public support of tax levies for AORTA. Resource economics or political economics deals with issues such as: Are there any reasons why non-riders would vote for tax levies? Three possibilities which might lead to support are briefly discussed: (1) pollution or congestion, (2) concern for the poor, or (3) option demand for future availability of public transit. It appears that option demand provides the most likely reason for more riders to support these levies.

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Revenue, Expenditure, and Fare Projections

Property Tax

Table 1 shows the projected tax revenues from a one-mill levy in each county. These estimates are made using the 1977 tax base.

Table 2 shows the estimated percentage increase in property values and property tax revenues in the proposed AORTA Region over time with a base year of 1977. An annual inflation rate in property values of 5 percent is assumed.

Due to recent state legislation property tax revenues do not increase proportionally with inflation. The tax reduction factor (ORC 319.301) computations are complex. However, the basic result is to freeze the assessed value of real property at the 1977 level for all outside (or voted) millage.

While the tax reduction factor does not apply to tangible personal property (i.e., machinery, equipment, and inventories), the assessment ratio is declining by 2 percent per year over the next 10 years (ORC 319.301 and 5711.22). As a result the 1980 taxes on tangible property would only be 4 percent greater than the 1977 levels if there was an annual inflation of 5 percent.

The estimates in Table 1 assume an annual inflation rate of 5 percent on the market value of the 1977 tax base but no new construction.[1/] The 1980 estimated property tax collection from one mill of outside millage in the AORTA region is only 1 percent above the 1977 levy of $553,271. In 1985 and 1990 the revenue increases by 7 and 20 percent respectively. Athens County accounts for approximately 1/3 of the property tax revenues in each year.

The market value of the property increases much more rapidly than the tax revenue due to the recent changes in Ohio law. Table 2 gives the percentage increases in the market value of the tax base and the tax collections.

1/ Details on the assumptions used in these estimates and an example for Athens County are given in Appendix B.

Table 1: Projected Property Tax Revenue from a One Mill Levy by County; 1980, 1985, 1990

County	--Year-- 1980	1985	1990
Athens	182,871	191,260	214,540
Hocking	106,720	111,300	122,980
Meigs	106,870	114,620	133,980
Perry	102,580	109,080	119,720
Vinton	54,230	58,260	63,700
Total	553,271	584,520	654,920

Source: Computed

Table 2: Percent Increase in 1977 Market Values and Property Tax Collections at 5 Percent Annual Inflation in the 1977 Base, AORTA Region

	--Year--		
	1980	1985	1990
Market Values of Tax Base	1.16	1.47	1.89
Tax Revenues	1.01	1.07	1.20

Sales Tax

Table 3 lists the projected tax revenues from a 1/2 of 1 percent sales tax. These estimates are based on the 1977 collections of state sales tax in each county. It is assumed that the value of sales will increase by 5 percent per year over this period.

In 1980 the estimated sales tax revenue in the AORTA region would be over $695,000. By 1990 this would increase by 65 percent to over $1.1 million. Athens County would probably account for slightly over half of the total in each year.

Estimated Revenue Deficits

The estimated revenue deficits shown in Table 4 were computed on the following assumptions:

1) Expenditures in 1977 would increase by 10 percent per year.
2) All revenues other than the ARC and federal aid would increase by 5 percent per year. (Data on expenditures and revenues are from pages 24 and 22 respectively of the 1977 AORTA Annual Report. See Appendix C.)
3) All ARC and federal grants will be terminated.

The estimated annual deficit in 1980 would be $151,930 and would increase to $562,974 by 1990.[2/] The use of 10 percent inflation in expenditures and 5 percent in other revenues may overstate the latter deficits.

Required Rates - Alternative Revenue Sources

Three options are outlined in Table 4 for generating sufficient revenue to cover these deficits. Each estimate is made independently. For example, in 1980 a property tax rate of $0.26 per $1,000 assessed value (0.26 mills) or a sales tax rate 1/10 of 1 percent or an average fare of $2.33 could cover the estimated deficit.

The property tax rate would need to be approximately 3/10 of a mill in 1980, rising to 9/10 of a mill in 1990 if it was the only source of increased revenues. A $45,000 home would pay about $5 annually in 1980 and $25 by 1990 given the assumptions used in this analysis.

2/ This is shown in current dollars.

Table 3: Projected Sales Tax Revenues from a 1/2 of 1 Percent Levy

	1980	1985	1990
Athens	375,866	482,906	617,728
Hocking	95,903	123,215	157,615
Meigs	105,574	135,639	173,508
Perry	91,031	116,954	149,607
Vinton	27,272	35,038	44,821
Total	695,679	893,752	1,143,279

Table 4: Estimated Property Tax Rate, Sale Tax Rate or Average Fare to Replace Grant Funds to AORTA; 1980, 1985, and 1990

Item	1980	1985	1990
Estimated Revenue Deficit[1/]	151,930	302,065	562,974
Required Rates			
Option 1: Property Tax Rate per $1,000 Assessed Valuation	$0.27	$0.52	$0.86
Option 2: Sales Tax Rate[2/]	1/10 of 1 percent	2/10 of 1 percent	2/10 of 1 percent
Option 3: Fare Required[3/]	2.33	3.85	6.51
Increase in Average[4/] Fare from 1977	1.91	3.43	6.14

1) These estimates are based on tenuous data and strong assumptions. See the text for clarification.

2) The actual estimates are .00109, .00168, and .00246.

3) Computed by dividing the deficit and 1977 earned revenues by the 1977 passenger level.

4) The average fare in 1977 was 42 cents. This was computed by using revenue data on fares, charter earnings and senior citizens assistance, and total passengers (page 22 and 24 - AORTA 1977 Annual Report). 1977 Average Fare = $76,359 ÷ 183,396 = 42¢
Without senior aid: 1977 Average Fare = $46,793 ÷ 183,396 = 26¢

While the sales tax cannot be levied in this fashion, Table 4 indicates that only 1/10 of 1 percent is needed initially under these assumptions.

The passenger fare increases are substantial. The average fare in 1977 was $0.42. This is computed by dividing earned income by the total passengers. If senior citizen aid is excluded, the average fare is only 26 cents. Note that the 1977 passenger count was used throughout the estimates of the fares required. If the number of passengers continues to increase, the average required fare would be less than shown in Table 3.

While the estimates in Table 3 may be helpful in considering alternative funding options, better data are needed before setting a proposed tax rate. Specially data is needed on:

1) Expenditure projections
2) Passenger projections
3) Non-tax revenue projections
4) The price elasticity of AORTA service; i.e., how much will ridership fall for each increase in the price of fares?
5) Data on the geographic distribution of the actual number of riders as well as on the number of trips

The Economic Rationale for Public Support of of Tax Levies for AORTA

Can the data in Table 4 predict anything about the chances for passage of the tax levy for an RTA? Assuming the projections in Table 4 are at least approximately correct, AORTA's current riders obviously will support the tax levies as opposed to a system completely financed by user fees. But are there enough riders to pass the levies?

AORTA Riders

While the number or riders is not reported in AORTA's annual report, some approximations can be made from the data on passengers. In 1977 there were

183,396 one-way trips. The lowest estimate of riders comes from assuming each person rode twice a day, 5 days a week, 50 weeks a year. This yields 500 trips per person and implies only 367 riders, assuming two trips per week would yield 917 riders. Probably the highest estimate is based on the assumption that each rider only takes two round trips per month. This yields an estimated 3,820 riders. It is difficult to predict whether riders using the system only twice a month would have strong incentives to vote for the tax levies.

In 1976 these five counties had a population of 133,400. Assuming 70 percent are of voting age (Ohio's average) and 30 percent vote in the election, the riders or their families would make up between 1.3 and 13.5 percent of the voting populations. These low percentages suggest that the levies will need to be supported by a larger number of non-riders if they are to pass.

However, with current discussion of tax and spending limitations for all levels of government, are there any reasons why non-riders would vote for tax levies? The reasons for public financial support varies with the type of service. The three that may apply to AORTA are: 1) the third party effects, 2) redistribution of income, and 3) the option demand.

Third party effects, or externalities, are the indirect side effects from a market decision. The market system establishes prices for each good or service depending on the costs to the producer and the value to the consumer. But sometimes these prices do not reflect the side effects on third parties who are not involved in the negotiation. Examples are: 1) downstream flood control consequences of a private power dam, 2) civic derogation indicident upon building a private slaughterhouse or factory, or 3) reduction of the

recreational and life support services of air, water, and land from private pollution.[3]

Private automobile emissions are major air pollutants. To some degree federal mandates have incorporated these environmental costs into the price by requiring unleaded gasoline and additional pollution controls. But the job is not complete. Parking and traffic congestion are also problems in some municipalities.

Some non-riders may wish to encourage others to ride mass transit as a means of reducing air pollution, traffic congestion, and parking congestion. However, the rural environment in the AORTA region probably reduces these concerns considerably. While this might be a rationale for support with some voters, I speculate that the number sharing this view is very limited.

Redistribution of income (either by providing services or through cash payments) is the rationale for many publicly supported programs. The continuation of AORTA fares at approximately the same levels may have the same motivation. Some non-riders may feel we must provide a low cost means of public transportation to senior citizens and low income persons. The current discount fare available to senior citizens is one example.

The target efficiency of an income redistribution program is the degree to which the actual redistribution coincides with the desired redistribution. This involves both the accuracy of the program in assisting only the target group and the comprehensiveness of the program in assisting all of that group.[4]

[3] For a fuller discussion of these, see Haveman, Robert H., "Efficiency and Equity in Natural Resource and Environmental Policy," American Journal of Agricultural Economics, Volume 55, Number 5, December 1973.

[4] See Weisbrod, Burton A., "Collective Action and the Distribution of Income: A Conceptual Approach" in Public Expenditures and Public Policy, ed. R. H. Haveman, J. Margolis, Markham, Chicago, 1971.

The target efficiency of AORTA's current public subsidy appears low. Bus fares are held at 1/3 the full cost not only for the poor but for all riders. An expanded use of vouchers or discounted tickets could allow the system to subsidize low income riders while raising fares to others. Since the target efficiency appears low, I hypothesize that this is not a strong rationale for public support among many non-riders.

Option demand refers to the willingness of individuals to pay for the option of having a service available even if they do not plan to use it in the near future.[5/] For example, I am willing to pay taxes toward a natural park system even though I will not be visiting most of them in the near future. However, I may wish to someday. Only through governmental action can this wish be converted into the revenue needed to establish and maintain the system.

Non-riders may be willing to provide tax support for AORTA to insure its availability at a later point. Those expecting substantial increases in gasoline prices are more likely to have a high option demand.

The probability of passage of tax levies is probably highest in areas where:

1) the number of riders is greatest,
2) non-riders are most aware and concerned with questions such as pollution, congestion in parking which public transit can help reduce,
3) non-riders' income and socio-economic background would encourage them to support income redistribution measures.
4) non-riders are most cognizant of the energy shortage expected in the mid 1980's and the concomitant price increases for fuel.

5/ Weisbrod, Burton A., "Collective-Consumption Services of Individual-Consumption Goods," Quarterly Journal of Economics, 78:471-477, August 1964.

The relevant weights of items 2, 3, and 4 are impossible to judge. In this area public transportation is probably not going to make a noticeable difference on air quality. There are many other ways to assist the poor, many of which may be more efficient than the current AORTA system. However, maintaining the option to use public transportation may require tax support. Whether the demand for such an option is strong enough to carry a sales or property tax to voter approval is not certain.

Appendix A

Summary of Ohio Tax Law on Transit Authorities

A regional transit authority (RTA) may levy both property and sales taxes. A few of their characteristics are outlined here:

1. Property Tax (ORC 306.49)
   - 1.1 This is voted millage and requires a majority vote within the RTA boundaries.
   - 1.2 It can be used for all purposes other than bond debt charges.
   - 1.3 The levy cannot be in excess of five mills.
   - 1.4 If the tax levy is defeated in the RTA, it can be submitted to the largest municipality at the next election. If it passes, the tax revenue can only be used within that municipality.
2. General Obligation Bonds (ORC 306.40)
   - 2.1 The net indebtedness of the RTA shall never exceed 5 percent of the assessed property value in the RTA area.
   - 2.2 It requires approval by a majority vote in the RTA area.
   - 2.3 The aggregate annual debt service cannot exceed 1/10 of 1 percent of the assessed value in the RTA area.
3. Sales Tax (ORC 306.70)
   - 3.1 This tax needs the approval of the majority of the voters in the RTA area.
   - 3.2 The sales tax apparently cannot be levied in only a portion of the RTA.
   - 3.3 The rates can be 1/2 of 1 percent, 1 percent, or 1 and 1/2 percent.

Appendix B

Assumptions and Procedures Used in Property Tax Revenue Projections

The following assumptions were necessary due to the lack of data:

1) There will be no significant growth or decline in the region during this period. The 1977 property tax base is shown in Table B-1.
2) The market value of the tax base will increase by 5 percent per year.
3) The current tax system remains in effect.
4) Ninety percent of the public utility assessed value is tangible personal property. No county or state data are available to establish this division. This estimate is based upon discussions with the Jackson County Auditor. If 85 percent of assessed value is assumed to be tangible property, the revenue for the region from one mill would be 2/10 of 1 percent less by 1980.

To illustrate how the projections in Table 1 are derived, an example is given for Athens.

	Millions
Step 1 - Assessed Real Property in 1980 =	$104.10
This is the same as in 1977 because the RTA must use only outside millage and no growth other than inflation is assumed.	
Step 2 - Tangible Personal Property in 1980	17.17
1977 Base x Inflation Factor x (Assessment Adjustment Factor)	
$16.3 \times (1.05)^3 \times .91 = 17.17$	

	Millions
Step 3 - Public Utilities - Real Property	5.88
1977 Base x Percent Real Property	
58.8 x (.10) = 5.88	
Step 4 - Public Utilities - Tangible Personal Property	55.72
(1977 Base x Percent Tangible Property) x Inflation Factor x (Assessment Adjustment Factor)	
$(58.8 \times .90) \times (1.05)^3 \times .91 = 55.72$	
Total	$182.85

At one mill ($1/1000 assessed value) the $182.85 million yields $182,850.

The estimates shown in Table 1 will understate the actual revenues if the region grows significantly. However, this approach gives a conservative estimate of the revenues.

The property tax revenue projections also may underestimate the actual changes if the rate of inflation is higher than the 5 percent annual rate assumed. Table B-2 shows the percent changes in the total assessed valuations in each county from 1967 to 1977. It ranges from an annual average of 4.4 percent in Athens to 11.0 percent in Meigs County. As Table B-3 indicates, the recent increases are considerably greater than the average suggests and much greater increases have occurred in real property than in the other classes of property.

The real property taxes on voted millage is frozen at 1977 assessment factors (ORC 319.301). The 5 percent assumption is consistent with the ten-year average for tangible personal property, which is the only component which yields additional tax revenues proportional to inflation.

Table B-1: Taxable Value of All Property, 1977

	Real Property	Tangible Personal Property (millions)	Public Utility Property	Total
Athens	$104.1	$16.3	$ 58.8	$179.2
Hocking	68.6	17.1	19.6	105.3
Meigs	42.4	18.9	43.2	104.5
Perry	70.0	15.7	17.8	103.5
Vinton	21.1	13.7	18.2	53.0
Total	306.2	81.7	157.6	545.5

Table B-2: Percentage Increase in Assessed Valuation of All Properties 1967-77

County	1967-77[1/]	Average[2/] Annual
Athens	53	4.3
Hocking	99	7.0
Meigs	190	11.0
Perry	96	7.0
Vinton	136	9.0

1) Ohio Public Expenditure Council, County Data 78-4

2) The average annual rate which when compounded annually yields the 1967 to 1977 increases.

Table B-3: Percent Increase in Assessed Valuation by Class of Property, Ohio, 1967-1977

	1967-77[1]	Average[2] Annual	1975-76[3]
Real Property	83.5	6.3	16.2
Public Utilities	61.5	4.9	8.0
Tangible Personal Property	52.4	4.3	8.5
Total	72.7	5.6	13.2

1) Ohio Public Expenditure Council - County Data 78-4.

2) This is the annual interest rate which when compounded annually yields the increase shown for 1967-77.

3) Ohio Public Expenditure Council - County Data 77-4.

Appendix C

Data on AORTA